Treatment of substrates for production of microelectronic and/or optoelectronic devices includes two sacrificial oxidation stages with intermediate polishing stage

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Abstract

Treatment of the substrate (1) having an effective layer (6) that at least partly contains oxidizable material on at least one of its surfaces comprises sacrificial oxidation (100) to a set depth, to remove some of the effective layer (6), polishing (200) the oxidized surface, and further sacrificial oxidation (300), to remove more material from the polished effective layer (6) surface (17). The first sacrificial oxidation stage includes oxidation step of at least part of the thickness of material having defects, followed by deoxidation of the oxidized material. The second sacrificial oxidation stage includes oxidation of at least part of the thickness of material in which defects have been introduced by polishing, followed by deoxidation of the oxidized material. At least one of the sacrificial oxidation stages includes also includes annealing of the substrate (1). Each oxidation step of each sacrificial oxidation stage is capable of forming, before the end of annealing, an oxide layer (14) that protects the remainder of the substrate (1). A layer of material over a thickness above 100 Angstrom , preferably 400-1000 Angstrom , is removed, owing to the second sacrificial oxidation stage. Preferably, the process includes implanting ions into a plate of semiconductor material, placing the surface of the plate in intimate contact with a support substrate (2), and cleaving the plate at the implantation zone level, in order to transfer part of the plate onto the substrate and to form a semiconductor thin layer or film on it. The thin layer or film comprises the effective layer (6), which is subsequently subjected to the first and second stages (100, 300) of sacrificial oxidation and polished (200). Preferably, the effective layer (6) is silicon. Owing to the second sacrificial oxidation stage (300), the silicon layer has a defect concentration of less than 5 * 10<2> cm<-2>, as determined by the SECCO technique.

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